ASSIGNMENT 6

Textbook Assignment: "Electrical Appliances, Equipment, Motors, and Generators," chapter 7, pages 7-1 through 7-56.

6-1. Electrical appliances are categorized into how many different types?

1. One
2. Two
3. Three
4. Four

6-2. A hot water heater is what type of appliance?

1. Fixed
2. Portable
3. Stationary

6-3. A window air conditioner is what type of appliance?

1. Fixed
2. Portable
3. Stationary

6-4. A toaster is what type of appliance?

1. Fixed
2. Portable
3. Stationary

6-5. When you have a major appliance with a broken part, it is permissible to replace the part with another brand name appliance part.

1. True
2. False

6-6. What is the connected receptacle requirement for portable appliances?

1. A single-pole, 20-A, 110-V disconnect
2. A double-pole, 15-A, 110-V disconnect
3. A 15-A, 110-V duplex outlet
4. A 30-A, 110-V duplex outlet

6-7. What type of disconnecting means is permissible for portable appliances?

1. A single-pole, 20-A, 110-V disconnect
2. A receptacle and attachment plug
3. A breaker within the power panel
4. A unit switch that is not part of the appliance

6-8. What publication should you consult before installing a ground in an appliance circuit?

1. Project specifications
2. NAVFAC guide specifications
3. *National Electrical Code*®
4. *Lineman's Handbook*®

6-9. What term identities a branch circuit that supplies electrical energy to one or more outlets to which appliances are connected?

1. Receptacle
2. Lighting
3. Equipment
4. Appliance

6-10. Permanently connected lighting fixtures may be connected to an appliance branch circuit only if the lights are in the same room.

1. True
2. False

6-11. Which of the following areas/rooms is NOT a branch circuit location?

1. Dining area
2. Kitchen area
3. Breakfast room
4. Small bedroom or computer room

6-12. What number of branch circuits are required to be installed in a laundry room?

1. One
2. Two
3. Three
4. Four

6-13. What minimum number of appliance branch circuits are required in a kitchen?

1. One
2. Two
3. Three
4. Four

6-14. Which, if any, of the following circumstances allows the ground prong from a three-prong power cord to be removed?

1. If the duplex outlet grounding convenience is not available
2. If the circuit does not exceed 20 amperes
3. When the equipment in use is double-insulated
4. None of the above

6-15. In a washing machine, what component is the heart of the electrical system?

1. Motor
2. Timer
3. Pump
4. Transmission

6-16. Which of the following statements describes a washing machine timer function/operation?

1. It is a synchronous-type motor
2. It has a ratchet mechanism that permits it to advance manually
3. It controls the operation of the washer
4. Each of the above

6-17. In a washing machine, what component engages the friction wheel of the motor to extract water from the tub?

1. Transmission
2. Electrical solenoid
3. Thermal overload
4. Pulley belts

6-18. What is the major cause of washing machine pump failure?

1. Clogged hoses leading to and from the pump
2. Belt slippage between the friction wheel of the pump and the motor
3. Foreign objects lodged in the pump
4. Failure of the solenoid

6-19. In a washing machine, what minimum water pressure is needed to overcome the mixing valve plunger spring pressure for water to fill?

1. 10 lb
2. 15 lb
3. 20 lb
4. 25 lb

6-20. In a washing machine, what is the end result, if any, of loosening the water-level switch screw?

1. It allows the water level to rise
2. It allows the water level to fall
3. It sets the water level to normal
4. None

6-21. Most washing machines have what minimum number of safety switches?

1. One
2. Two
3. Five
4. Four

6-22. What device de-energizes the washing machine timer motor during the filling cycle?

1. The water level switch contacts
2. The inlet valve contacts
3. The water pump

6-23. What is a good starting point in troubleshooting a washing machine?

1. Check the timer
2. Try starting the machine
3. Check the water supply
4. Check the safety switches

6-24. An electrical clothes dryer is not as complicated as a washing machine.

1. True
2. False

6-25. In an electric dryer, what component controls the temperature of the air that passes through the clothes?

1. The high- and low-limit thermostats
2. The timer
3. The safety thermostats
4. The electric heater

6-26. Where are the thermostats located on an electric dryer?

1. On the back wall of the drum
2. On the side wall of the drum
3. In the door panel
4. In the exhaust housing

6-27. A surface burner may be set to what number of positions on a modem electric range?

1. 5
2. 10
3. 15
4. 20

6-28. What type of meter should be used to check for an open in a heating element of an electric range?

1. Ammeter
2. Wiggins
3. Voltmeter
4. Ohmmeter

6-29. The most reliable method of testing switches in an electric range is to measure their

1. resistance
2. voltage
3. current
4. temperature

6-30. A heating element is faulty when a voltage reading is present across the terminals of a closed switch.

1. True
2. False

6-31. A hot water heater thermostat responds to changing water temperature at what location within the tank?

1. Top of the tank
2. Middle of the tank
3. Bottom of the tank

6-32. When the top part of a hot water tank has reached its preset temperature, what is the position of the (a) top contact and (b) bottom contact of the double-throw thermostat?

1. (a) Open (b) open
2. (a) Closed (b) open
3. (a) Open (b) closed
4. (a) Closed (b) closed

6-33. A double-throw thermostat on a hot water heater controls which of the following heating elements?

1. Lower
2. Upper
3. Both lower and upper

6-34. Manual and automatic are the two general classes of appliance control.

1. True
2. False

6-35. What type of switch is used to reduce arcing and pitting of its contacts when its position is changed?

1. Toggle
2. Hydraulic control
3. Rotary
4. Bimetallic blade

6-36. A helix control uses what principle of operation?

1. A thermostatic metal that coils and uncoils when heat is applied
2. A make-and-break action that interrupts current flow
3. A fluid-filled capillary tube that is heated by the appliance and maintains a constant temperature
4. A three-position switch that changes the heat level

6-37. Which of the following actions should you take to adjust the temperature control of a hydraulic control switch?

1. Increase or decrease the amount of fluid in the capillary tube
2. Shorten or lengthen the capillary tube
3. Replace the control
4. Loosen the two slotted screws and move the slotted adjusting plate left or right

6-38. What should be your first step before troubleshooting a circuit?

1. Make a visual inspection
2. Secure the power
3. Study the schematic
4. Check for loose connections

6-39. What item should you check first before attempting to locate an electrical fault in an appliance?

1. The outlet for power
2. The power cord
3. Both 1 and 2 above
4. The multimeter

6-40. Which of the following steps should you take before working on an electrical appliance?

1. Open the switch to the appliance
2. Lock and tag all switches in the open position
3. Remove the protective devices
4. Each of the above

6-41. When a switch of an appliance is tested with an ohmmeter, what does a reading of 0 ohms indicate if the switch is on?

1. A bad switch
2. An open switch
3. A direct short in the switch
4. A good switch

6-42. For an ammeter to measure current in a circuit, it must be connected in what manner?

1. Across the line
2. In parallel with the circuit source and load
3. In series with the circuit source and load
4. In series-parallel with the load and line

6-43. When measuring current of unknown amperage with an ammeter that is capable of measuring several ranges, you should make the first measurement with the meter set at what range?

1. A range slightly higher than the estimated current
2. The highest range
3. The range of the estimated current
4. The lowest range

6-44. The presence of three internal resistors in a voltmeter schematic indicates that what voltmeter characteristic?

1. The meter is more rugged than one with only one resistor
2. More protection is provided to this meter than to one with only one resistor
3. The meter has three voltage ranges and scales
4. The meter may be used for three times its rated voltage

6-45. Which of the following conditions indicate(s) you are measuring ac voltage with a line voltage indicator?

1. The neon lamp indicator glows
2. You hear an audible hum
3. You feel a vibration when the testing indicator is hand-held
4. Each of the above

6-46. When you are measuring dc voltage with a line voltage indicator, both the positive and negative electrodes glow.

1. True
2. False

6-47. What action should you take after completing a test with an ohmmeter?

1. Turn the meter to the dc supply positive
2. Turn the meter to the dc supply negative
3. Turn the meter off
4. Set the selector switch to R_1

6-48. You are preparing to take a voltage reading with a multimeter. After you have determined the approximate voltage on the circuit you are about to test, what should be your next step?

1. Turn off the power to the circuit
2. Plug the test leads into the appropriate jacks
3. Connect the test leads to the conductors
4. Set the function switch

6-49. What is the difference between a megger and a typical ohmmeter?

1. A megger uses ac voltage; an ohmmeter uses dc voltage
2. A megger can apply a much higher dc voltage to a circuit than an ohmmeter
3. A megger, unlike an ohmmeter, has an indicator within the instrument enclosure

6-50. When you are conducting an insulation resistance test using a megger, which of the following conditions can cause the needle to deflect to zero?

1. There is no resistance between the test leads
2. The test leads are touching each other
3. The insulation is broken near the test points
4. Each of the above

6-51. What is the purpose, if any, of keeping records of insulation tests?

1. Technical publications recommend it
2. The scheduling of future tests
3. Trends may indicate future problems
4. None

6-52. Of the following conditions, which one(s) would cause a motor to have a low insulation resistance when tested?

1. Moisture
2. Dirt
3. Dust
4. Each of the above

6-53. When taking an insulation resistance test on a cable that is a performance natural, you get a reading of 6.0 megohms at a temperature of 104°F. What is the correct value of resistance?

1. 19.56 megohms
2. 23.10 megohms
3. 24.90 megohms
4. 30.48 megohms

6-54. When taking an insulation resistance test on an oil-filled transformer, you get a reading of 2.0 megohms at a temperature of 131°F. What is the correct value of resistance?

1. 10.0 megohms
2. 22.4 megohms
3. 31.0 megohms
4. 31.7 megohms

6-55. When taking an insulation resistance test around a piece of high-voltage equipment, you should take which of the following actions?

1. Ground the megger
2. Disconnect the apparatus
3. Work under direct supervision
4. Each of the above

6-56. When taking an insulation resistance test, when, if ever, should you discharge a cable of its capacitance?

1. Before making the test only
2. After making the test only
3. Before and after making the test
4. Never

6-57. What are the four main parts of a split-phase electric motor?

1. Stator, rotor, end plates, and centrifugal switch
2. Poles, armature, core, and shaft
3. Starting windings, running windings, frame, and rotating core
4. Coils, end bells, bearings, and commutator

6-58. The centrifugal switch disconnects a motor's starting windings at what percentage of the motor's full speed?

1. 50%
2. 75%
3. 80%
4. 100%

6-59. To reverse the direction of rotation of a split-phase motor, you should interchange the connection of what leads of the motor?

1. Power
2. Running winding
3. Starting winding
4. Centrifugal switch

6-60. You are using an electric motor and the rotor suddenly locks. What is the possible cause of this malfunction?

1. The input voltage is high
2. The motor bearings are worn out
3. The centrifugal switch did not open at the desired speed
4. The motor current is too high

6-61. Before you take an electric motor completely apart, which of the following actions should you take?

1. Take out the pulley connected to the motor shaft
2. Mark the position of the shaft
3. Put a center punch mark at the stator ends and their matching end plates
4. Identify and mark the starting and running winding leads

6-62. The starting winding of an electric motor is always placed what number of degrees out-of-phase with the running winding?

1. 30
2. 45
3. 90
4. 120

6-63. Capacitor motors have what advantage over split-phase motors?

1. Capacitor motors are less expensive
2. Capacitor motors weigh less
3. Capacitor motors have higher starting currents
4. Capacitor motors have higher starting torque

6-64. What type of electric motor can be operated with either ac or dc power?

1. Split phase
2. Salient pole
3. Capacitor start
4. Capacitor run

6-65. The stator and rotor windings in a salient-pole universal motor are connected in what manner?

1. In series with the power source
2. In series with the centrifugal switch
3. In series with the capacitor
4. In parallel with the power source

6-66. The rotation of a three-phase electric motor can be reversed by interchanging what leads?

1. All three of the motor's leads
2. Any two of the motor's leads
3. The starting winding leads
4. All three leads of the power source

6-67. What are the horsepower and voltage limitations of manual motor controllers?

1. 7.5 hp at 600 volts, three-phase and 3.0 hp at 220 volts single-phase
2. 2.0 hp at 600 volts, three-phase and 1.0 hp at 220 volts single-phase
3. 20.0 hp to 50.0 hp at 220 volts, three-phase or single phase
4. 2.0 hp or less at 300 volts or less, single-phase only

6-68. Which of the following types of motors, if any, is allowed to be controlled by a toggle switch?

1. All single-phase motors
2. 2.0 to 5.0 hp motors only
3. Motors of 2.0 hp or less
4. None

6-69. On a shaded pole motor, the starting windings are (a) constructed and (b) located in what manner?

1. (a) Of small gauge magnet wire (b) wound on top of the running windings
2. (a) Of large gauge magnet wire (b) wound on top of each stator pole
3. (a) Of copper bands (b) wrapped around one tip of each stator pole

6-70. Shaded-pole motors have which of the following characteristics?

1. High torque
2. Large horsepower
3. Low torque
4. High voltage

6-71. On a three-speed, split-phase fan motor, the windings are connected in what manner for low speed operation?

1. The running winding is connected across the line and the starting winding is connected in series with the auxiliary winding
2. The running winding is in series with half the auxiliary winding
3. The starting winding is in series with half the auxiliary winding
4. The running and auxiliary windings are in series across the line and the starting winding is connected across the line

6-72. For a wye-connected three-phase electric motor, what number of leads are brought out to the terminal box?

1. 12
2. 9
3. 6
4. 4

6-73. Air pressure used for cleaning open-frame electric motors should not exceed what psi?

1. 10
2. 15
3. 25
4. 30

6-74. Motor contactors that remain closed for long periods of time with infrequent operation use what material for contacts?

1. Aluminum
2. Carbon
3. Copper
4. Silver

6-75. In troubleshooting an alternating-current controller, you notice the coils are overheating. Which of the following is a probable cause for this condition?

1. Loose connections
2. Inadequate spring pressure
3. Misalignment of parts
4. Open armature gap